

EMERGENCY ACTION PLAN

BIG CREEK DAM 1 AND DAM 2

NATIONAL INVENTORY OF DAMS NOS: OR00225, OR00473

NEWPORT, OREGON

JUNE 9, 2009

Prepared for:

The City of Newport
Public Works Department
169 SW Coast Hwy
Newport, Oregon 97365
541-574-3366

Prepared by:

WEST Consultants, Inc.
2601 25th St. SE, Suite 450
Salem, OR 97302(503) 485-5490

REVISIONS

All revisions to the original Emergency Action Plan shall be documented in this section:

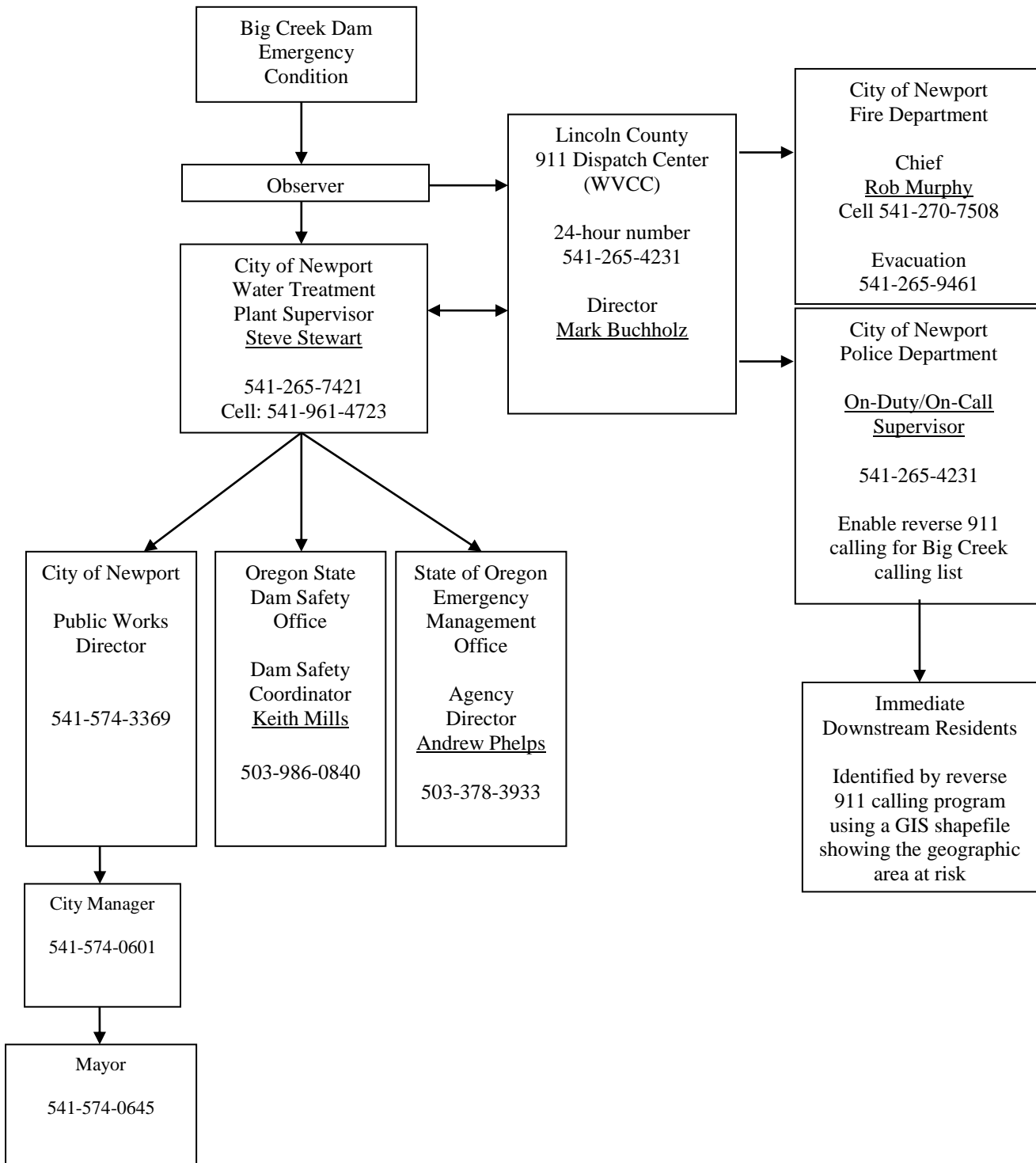
1. **This is the ORIGINAL VERSION, dated June 9, 2009. Prepared by WEST Consultants Inc., Salem, Oregon.**
2. **Updated Fire Chief, Public Works Director, City Manager, Mayor. March 18, 2016. Edited by Steve Stewart**
3. **Updated Emergency Management Office Agency Director, Newport Police contact number and Lincom director. August 30, 2017. Edited by Steve Stewart**

TABLE OF CONTENTS

- I. Notification Flowchart
 - A. Notification flowchart “A”, (use when dam failure is imminent or has occurred).
 - B. Notification flowchart “B”, (use for reporting observations of conditions at the dam that do not require immediate attention but could lead to a dam safety threat if not addressed)
- II. Statement of Purpose
- III. Project Description
- IV. Emergency Detection, Evaluation, and Classification
- V. General Responsibilities Under the EAP
 - A. Dam Owner Responsibilities
 - B. Responsibility for Notification
 - C. Responsibility for Evacuation
 - D. Responsibility for Termination and Follow-up
- VI. Preparedness
- VII. Inundation Maps
- VIII. Appendices
 - A. Location Map and Aerial Photograph
 - B. Drawings of Big Creek Dam No. 1 and No. 2
 - C. Photos of Big Creek Dam No. 1 and No. 2
 - D. Investigation and Analyses of Dam-breach Floods
 - E. Plans for Updating and Posting the EAP
 - F. Approval of the EAP
 - G. Document Registry

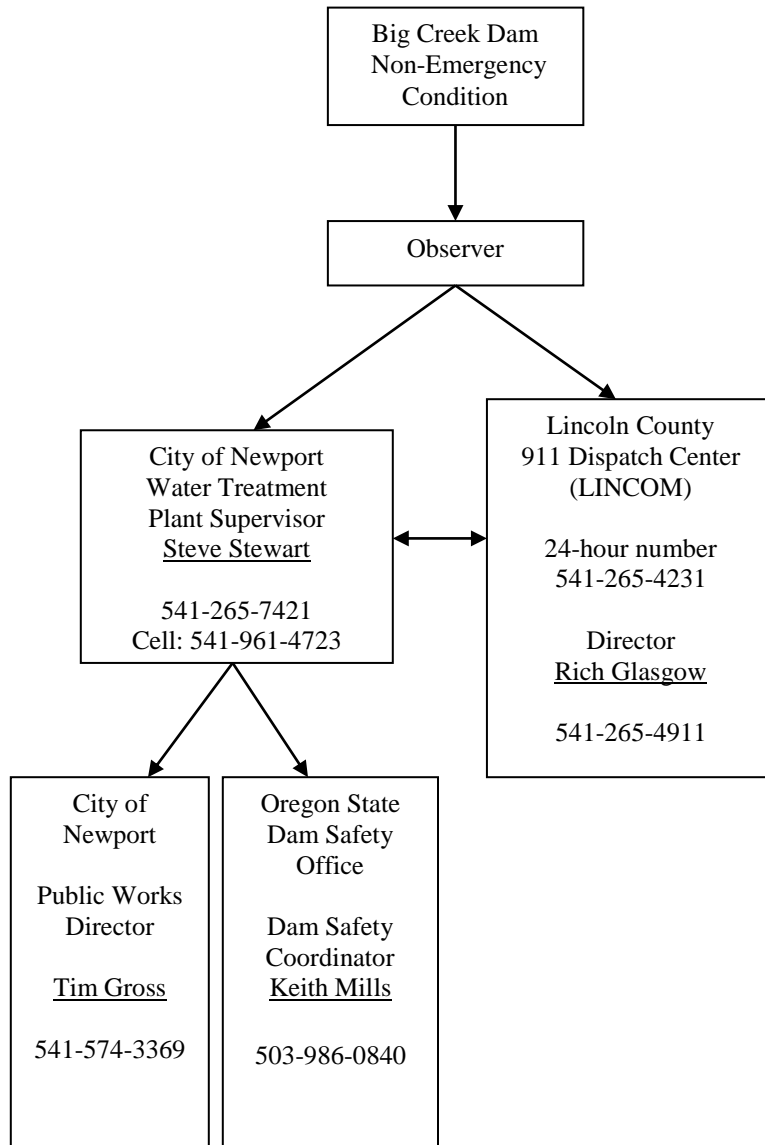
IA. Notification Flowchart A

USE NOTIFICATION CHART “A” WHEN DAM FAILURE IS IMMINENT OR HAS OCCURRED



IB. Notification Flowchart B

USE NOTIFICATION CHART “B” FOR REPORTING OBSERVATIONS OF CONDITIONS AT THE DAM THAT DO NOT REQUIRE IMMEDIATE ATTENTION BUT COULD LEAD TO A DAM SAFETY THREAT IF NOT ADDRESSED.



II. Statement of Purpose

This plan identifies conditions that may endanger Big Creek Dam No. 1 and No. 2 and defines procedures to notify the appropriate emergency management officials of possible, impending, or actual failure of the dam.

This EAP should be considered a fluid document which will require updating from time to time as circumstances warrant or when contact information presented on the notification page has changed. Nothing in this document shall replace the reasonable and logical application of judgment in the event of an actual emergency.

III. Project Description

Big Creek Dam No. 1 is located on Big Creek about 2 miles northeast of the City of Newport in Lincoln County, Oregon. It is directly downstream of Big Creek Dam No. 2. Dam No. 1 and Dam No. 2 are owned and operated by the City of Newport. A location map is shown in Appendix A. Dam No. 1 was designed by CH2M Hill, Inc. and constructed under the direction of the City of Newport in 1951. It is an earth embankment dam that is about 315 feet long, with a maximum height of 21 feet, and a crest width of 12 feet. Total storage volume at normal pool elevation is 190 acre-feet. Dam No. 1 is operated in conjunction with Dam No. 2 for municipal water supply.

Big Creek Dam No. 2 is located on Big Creek, 0.2 miles upstream of the reservoir formed by Big Creek Dam No. 1. Dam No. 2 was designed by CH2M Hill, Inc. and constructed under the direction of City of Newport in 1968 and enlarged in 1976. It is an earth embankment dam that is about 430 feet long, with a maximum height of 56 feet, and a crest width of 20 feet. Total storage volume at normal pool elevation is 970 acre-feet and stored water is used for municipal supply.

Both dams are located within Section 33, Township 10 South, Range 11 West, W. M. Big Creek joins the Pacific Ocean approximately 1 mile below Dam No. 1. Between Dam No. 1 and the ocean, Big Creek flows through a residential area, beneath U.S. Highway 101, and through Agate Beach State Wayside. Failure of either Dam No. 1 or Dam No. 2 could result in downstream loss of life and substantial property damage. An aerial photo of the Big Creek Dam No. 1 and No. 2 vicinity is shown in Appendix A.

The contributing basin area to Big Creek Dam No. 1 and No. 2, based on United States Geological Survey (USGS) Quadrangle Maps, is 3.2 square miles. Land use in the basin is primarily forest. The watershed varies in elevation from about 41ft (NGVD29) at the reservoir site to 845 feet (NGVD29) along the watershed boundary. Construction plans for Dam No. 1 and Dam No. 2 are shown in Appendix B.

The normal operating pool elevation for Big Creek Reservoir 1 (41.3 feet NGVD29) is 4.3 feet below the dam crest elevation (44.6 feet NGVD29). The dam is located on the west side of the reservoir and the pool elevation is primarily maintained by a gated outlet and an uncontrolled reinforced concrete side-channel spillway. The primary spillway is located at the southwest corner of the reservoir. The spillway inlet is has an expanded “L” shape with a crest elevation of 41.3 feet and has a total crest length of 36.5 feet. The outlet of the spillway enters a rock lined stilling basin located at the downstream toe of the dam. Big Creek County Road, located on the north abutment, serves as the emergency spillway. The roadway is approximately 22 feet wide.

The normal operating pool elevation for Dam No. 2 is 84.4 feet (NGVD 29), approximately 7.9 feet below the dam crest elevation (91.3 feet NGVD 29). The dam is located on the west side of the reservoir and the pool elevation is primarily maintained by an uncontrolled drop-inlet style spillway. The spillway consists of a 48-inch diameter, circular vertical drop inlet that connects to a 90-inch diameter conduit. The outlet of the conduit enters a stilling basin located at the downstream toe of the dam. Big Creek County Road, located on the north abutment, serves as the emergency spillway. The roadway is approximately 100 feet wide.

IV. Emergency Detection, Evaluation, and Classification

The objective of this section is to define the emergency detection, evaluation, and classification procedures.

a. Emergency Detection: Early detection of problems at the dam will most likely occur during bi-annual inspections conducted by Oregon Water Resources Department, Dam Safety Program, and monthly inspections by the Newport Public Works Department (PWD). Unexpected or emergency problems can be observed by the Newport PWD or general public at any time. The Newport PWD should be especially vigilant in their observation of the dam during extreme rainfall events.

b. Evaluation: The state of Oregon Water Resources Department, Dam Safety Program's bi-annual inspection generates a report covering the condition of the dam at the time of the inspection and also compares current inspection results to those from past inspections. A copy of the inspection report is sent to the Newport PWD, noting problems that need short-term, intermediate, or long-term fixes.

The Newport PWD performs a visual check on a daily basis and a complete inspection once a month. During or immediately following large storm events, such as those that occur once every 5 years on average or greater, or an earthquake, the Newport PWD should conduct immediate visual inspections of Dam No. 1 and Dam No. 2. The inspections should check for any changes in seepage, signs of slumping on the dams, evidence of erosion at the primary or emergency spillways, or threat of overtopping. Currently the daily visual check and monthly inspections are recorded in a log book. It is advised the Newport PWD develop an inspection checklist. An example of an inspection checklist can be found in the State of Oregon's Dam Safety Inspection Form. The web link to this form is http://www.oregon.gov/OWRD/SW/dams_in_oregon.shtml.

The Newport Fire and Police Departments will be responsible for the first physical response to an emergency 911 call. The City Manager, Police Chief, or Fire Chief will confirm the emergency condition, identify which level of emergency is being declared, what notification procedures are followed (Notification Flowchart A or Notification Flowchart B), and whether evacuation is required.

c. Classification: As shown in Table 1, there are three emergency classifications. Level I emergency classification involves problems detected during regular inspections. The problems are generally of a low-level nature and do not require immediate attention. However, if left uncorrected could lead to an emergency situation. LEVEL I emergencies require the observer to report the problem to the Newport PWD for corrective action.

LEVEL II classification indicates a serious problem with Dam No. 1 or Dam No. 2 that, if not corrected, could lead to an imminent breach condition in the near future. A Level II emergency requires the observer to report the problem to the Newport PWD and LINCOM 911 dispatch center.

Level III classification indicates either a dam breach is imminent or has already occurred. Level III emergencies require the observer to call the Newport PWD and LINCOM 911 dispatch center for emergency assistance. Evacuation of residents living downstream of the dam is required.

TABLE 1. EMERGENCY CLASSIFICATIONS		
EMERGENCY CLASSIFICATION	CONDITION	ACTIONS REQUIRED
LEVEL I	Problems detected during routine inspections or general observations that could lead to Level II or III emergency classifications if left uncorrected.	Report observation to Newport PWD and state of Oregon Dam Safety Office for corrective action. <u>Follow Notification Flowchart B</u>
LEVEL II	There is a serious problem with the dam that, if not corrected, could lead to a <u>breach condition in the near future.</u>	Report observation to Newport PWD or LINCOM 911 dispatch center and emergency notification plan is implemented. <u>Follow Notification Flowchart A</u>
LEVEL III	<u>Dam has been breached or breach is imminent.</u>	Report observation to Newport PWD and LINCOM 911 dispatch center. Evacuation is required. Follow <u>Notification Flowchart A</u>

d. Decision Criteria for Calling a Level I-III Emergency:

- a. Seepage: Changes in the amount of or water clarity of seepage coming off the downstream slope or toe of the dam is a serious issue. If there is only a change in the rate of seepage off the toe or downstream slope with no change in color or no noticeable areas of sinkhole or deformation on the dam, this should be noted and considered for follow-up inspection. If there is new seepage or the seepage becomes cloudy a **Level I** designation may be appropriate. If there is related slumping and landsliding that affects the freeboard of the dam and reduces it to below 1 foot of water level a **Level II** designation may be appropriate. If the dam has experienced deformation such that water is flowing over the crest of the dam with erosion occurring this could constitute a **Level III** emergency.
- b. Slumping loss of freeboard: In situations where there is a loss of freeboard to less than 2 feet between the crest of the dam and the water level, a **Level I** designation is warranted. A **Level II** emergency should be declared if the dam is beginning to overtop. If the dam has enough water going through a slump or over the crest to create erosion, then a **Level III** emergency may need to be initiated.
- c. Spillway is eroding: A **Level I** emergency should be declared if the spillway cracks and/or begins to erode during high water and the use of the spillway cannot be avoided. A **Level II** emergency should be declared if the situation deteriorates and if head cut develops that threatens to breach the dam. A **Level III** emergency should be declared when it is certain the dam will breach at the spillway and erosion is rapidly head cutting upstream. If spillway damage occurs during a period of low precipitation, no emergency designation is warranted. The damage should be noted and repaired as soon as possible.
- d. Dam is about to overtop: During severe high water events, if the spillway is full and water is within the freeboard limits of the dam (2 feet) a **Level I** emergency should be declared. **Level II** and **Level III** emergencies are declared only when water is overtopping with significant erosion indicating a breach or Level III situation.
- e. Other Situations: A strong earthquake (greater than 6.3) or evidence of a terrorist attack on the dam can be grounds for initiating a Level I situation or higher depending on the severity and reaction of the dam.

V. General Responsibilities Under the EAP

A. Dam Owner Responsibilities

The Newport PWD is responsible for the maintenance, repair and operation of Big Creek Dams No. 1 and No. 2 and requesting LINCOM 911 to develop a Big Creek Dam Emergency Call List on the Reverse 911 Program. The Newport PWD is also responsible for distribution of the Final EAP document to the agencies listed in Appendix G and updating the EAP as needed. Appendix E outlines plans for updating and posting the EAP. The Newport PWD will also distribute an announcement to downstream entities that may be impacted by a potential dam breach. The announcement should explain the purpose of the EAP and how emergency management of the potential hazard is expected to occur.

The following vendors have been identified as being able to provide useful services during a LEVEL I or LEVEL II emergency. This does not reflect a comprehensive list of possible vendors, and the status of these vendors may change periodically. It is incumbent upon the Newport PWD to maintain an updated list of vendors.

	Company	
	W W Construction	Central Coast Excavating Inc.
Address	7495 NE Avery St Newport, OR 97365-9574	671 NE Newport Heights Dr Newport, OR 97365
Phone	541-265-7090	541-265-8792
Services	Bentonite Sandbags Earthwork/large rock on short notice	Bentonite Sandbags Earthwork/large rock on short notice

If problems at the dam are classified as either LEVEL I or LEVEL II Emergencies, the following activities should be explored to correct the problems before a dam breach occurs:

- Change in Seepage. If there is a noticeable change in seepage volumes, evaluate the feasibility of dumping fine material such as bentonite upstream from the leak, if appropriate and/or possible. Vendors in the Newport Area that have bentonite available include: **W W Construction** and **Central Coast Excavating Inc.** Evaluate the feasibility of creating a temporary stability berm on the downstream toe of the dam to slow down and control erosion of the embankment at the point of seepage. Vendors that can provide earthwork on short notice include: **W W Construction** and **Central Coast Excavating Inc.**
- Signs of slumping or loss of freeboard. Evaluate the feasibility of building a temporary berm out of loose material or sandbags. The outlet conduit should be opened until the reservoir elevation is well below the freeboard level. Vendors that can provide earthwork and/or sandbags include: **W W Construction** and **Central Coast Excavating Inc.**
- Spillway is eroding. Evaluate the feasibility of placing large riprap rock to slow the erosion. Vendors that can provide large rock on short notice are:
W W Construction and **Central Coast Excavating Inc.**
- Dam is about to overtop. Make sure the inlet to the outlet is free of obstruction from debris. Check the emergency spillway to ensure that there are no obstructions to flow,

such as brush or sloughing of the sidewalls. All obstructions to flow in the emergency spillway should be removed immediately.

Should a problem be identified partial or full reservoir drawdown should always be evaluated as a method for reducing or eliminating risk of imminent dam breach.. Reservoir drawdown should be administered in a controlled fashion, without increasing flooding hazards downstream of the dam.

B. Responsibility for Notification

The Newport PWD, or any observer, should call 911 when a dam safety emergency for Dam No. 1 or Dam No. 2 is observed. The emergency call should specify whether the call is in regard to Dam No. 1 or Dam No. 2. The LINCOM 911 Dispatch Center will respond to that 911 call by contacting the Newport Fire Department, Newport Police Department, and Newport Public Works Department. If a Level II or III emergency is declared pursuant to Notification Flowchart A, the Newport Police Department will contact LINCOM 911 for activation of the Reverse 911 to notify downstream subscribers with a phone message. LINCOM 911 will be provided a GIS shapefile identifying the geographic area at risk from the dam failure. The shapefile will be used by the Reverse 911 calling program to identify all subscribers at risk. Each subscriber will be contacted automatically with a pre-programmed message.

If a Level I emergency is declared, then notification procedures in Notification Flowchart B will be followed.

C. Responsibility for Evacuation

The Newport Fire and Police Departments will be responsible for the first physical response to an emergency 911 call. The City Manager, Police Chief, or Fire Chief will confirm the emergency condition, identify which level of emergency is being declared and determine if evacuation of flood inundation zones is required. The Newport Police Department will be responsible for evacuating residents. Areas of expected dam breach inundation zones are shown in Section VII of this EAP. If additional resources are needed, the Newport Police or Fire Department can call other emergency service agencies as outlined in the City EOP.

If evacuation is required, the Lincoln County Health Department, with support from the Oregon Trail Chapter of the American Red Cross, will be responsible for sheltering, feeding, and providing first aid of the affected population as outlined in the Lincoln County EOP. Refer to ESF 6, Housing and Human Services and ESF 11, Agriculture and Natural Resources in the Lincoln County EOP.

Notification Flowchart “A” (Levels II & III) means a failure is imminent or has occurred (EVACUATE NOW) and notification flowchart “B”(Level 1) means dam safety conditions have been observed that do not require immediate attention but could lead to emergency conditions if not addressed (DO NOT EVACUATE AT THIS TIME).

D. Responsibility for Termination and Follow-Up

The Newport City Manager is responsible for making the decision that an emergency condition no longer exists at the dams. The Newport PWD will provide personnel to lead damage assessment teams as outlined in the City EOP Recovery Strategy. If individual assistance is authorized, local, state, and federal entities will establish a local disaster recovery assistance center to help with financial and housing assistance claims.

Following an emergency, an evaluation and review of the dam breach and emergency response will be conducted by the various participants involved: Newport Public Works Department, Newport Fire Department, Newport Police Department, Lincoln County Emergency Management Office, Oregon Dam Safety Office, and other emergency response agencies that assisted during the emergency. The following should be discussed and evaluated in the after-action written review:

- Events before, during, and following the emergency.
- Significant actions taken by each participant, and potential improvements for management of future emergencies.
- All strengths and deficiencies found in procedures, materials, equipment, staffing levels, and leadership.

A written report will be distributed to the participants by the Newport Public Works Department.

VI. Preparedness

The Newport City Manager coordinates training and maintains training records for City personnel. As outlined in Section 6 Plan Development, Maintenance, and Implementation of the City EOP Newport will conduct exercises throughout the year to test and evaluate emergency procedures.

The following is a summary of dam safety inspection responsibilities.

- A. **Annual Inspection** – Oregon Water Resources Department, Dam Safety Office.
- B. **Routine Inspections** – Newport PWD inspects Dam No. 1 and Dam No. 2 visually on a daily basis to ensure the structural integrity of the dam has not changed. Every 30 days the Newport PWD does a complete walk of the dams top to bottom. Dam No. 1 or Dam No. 2 is inspected daily if a leak is discovered.
- C. **Severe Weather Inspection** – During periods of severe weather, such as heavy rain, more frequent inspections will be conducted by the Newport PWD.
- D. **Coordination of Emergency Response Plan** – Each time the EAP is updated or revised, the Newport PWD will convene an informal meeting with the city, county, and state emergency management officials listed in the notification chart. The purpose of the meeting is to describe possible dam breach events, discuss evaluate the EAP response procedures, and resolve any questions or concerns regarding coordination and responsibilities.